The impact of keyword and full video captioning on listening comprehension

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Abstract

This study investigates the effect of two types of captioning (full and keyword captioning) on listening comprehension. Thirty-six university-level EFL students participated in the study. They were randomly assigned to watch three video clips under three conditions. The first group watched the video clips with full captions. The second group watched the same video clips with keyword captions. The control group watched the video clips without captions. After watching each clip, participants took a listening comprehension test. At the end of the experiment, participants completed a questionnaire to measure their perceptions about the use of captions and the video clips they watched. Results indicated that the full captioning group significantly outperformed both the keyword captioning and the no captioning group on the listening comprehension tests. However, this study did not find any significant difference between the keyword captioning group and the no captioning group. Results of the survey suggest that keyword captioning were a source of distraction for participants.

Keywords: captions, video, listening comprehension, ESL.

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1. Introduction

Listening comprehension has gained the interest of many educators because of its importance in second language (L2) learning (Vandergrift, 2011). It is a challenging skill for many L2 learners due to its complexity as it involves the simultaneous activation of knowledge sources and quick process of input (Winke, Gass & Sydorenko, 2010). Listening involves three cognitive processing phases–perceptions, parsing, and utilization (Anderson, 1983; 1995).The limited capacity of short-term memory among L2 learners makes them tend to forget what was heard while rushing to process the new input (Goh, 2000). The easy access to the Internet increased the availability of digital videos that can be shared via YouTube, for example, and used in the classroom. Videos that are enhanced with captions (i.e., same language or intralingual subtitles for supporting L2 learners' comprehension) are pedagogical tools that proved to have a positive impact on listening comprehension in many studies (Baltova, 1999; Chung, 1999; Markham, 2001). Captions may help develop learners' ability to establish a connection between auditory and visual input (Garza, 1991), which is an important element in successful listening comprehension. While several studies investigated the benefits of full captions for video comprehension, some researchers called for reducing the size of full captions and only limit captions to keywords (e.g., Garza, 1991; Winke et al., 2010). Keyword captioning includes only important words that help understanding the meaning of a given utterance. They are meant to help learners "listen more and read less" (Guillory, 1998). The findings of the few studies that examined keyword captions have not been consistent (Guillory, 1998; Park, 2004; Montero, Peters, Clarebout & Desmet, 2013). In other words, the question pertaining to the most beneficial mode of captions remains unanswered. In order to contribute to this line of research, this study investigates the effects of keyword-captioned and full-captioned video on listening comprehension in the context of native speakers of Arabic learning English as a foreign language (EFL). This study specifically aims at comparing the effectiveness of each captioned group in improving the performance of EFL students on listening comprehension test.

2. Literature review

A lot of the research that has been carried out on captioning examined its effects on L2 learners' comprehension of video content (Baltova, 1999; Chung, 1999; Garza, 1991; Huang & Eskey, 1999-2000; Markham, 2001; Montero Perez et al., 2014; Neuman & Koskinen, 1992; Park, 2004; Price, 1983; Winke et al., 2010). In one of the earlier studies, Price (1983) found that a captioned video improved the comprehension of learners with different proficiency levels. His findings were confirmed by Markham (1989) who found that captions enhanced the listening comprehension of English as a Second language (ESL) of university-level students. Participants of all proficiency levels (beginner, intermediate and high) benefited from full captions. The availability of full captions makes watching video clips a reading task. Consequently, it leaves less room for learners to develop their listening skills. One way to overcome this problem is to provide the learners with keywords instead of full captions (Garza, 1991; Winke et al., 2010). Keywords will include only essential words to the understanding of a given segment of the video. In this way, learners can still develop their skills and strategies to deal with unfamiliar content (King, 2002).

Only a few researchers answered the call for the need to explore the effectiveness of keywords captions on listening comprehension. The first study was conducted by Guillory (1998) who assessed the benefits of keywords for beginning-level learners of French. Participants watched two video clips under one of the following conditions: full captions, keyword captions (14% of the full captioning text), and no captioning. Results revealed that the full captioning and keyword captioning groups significantly outperformed the control group on listening comprehension test. There was, however, no significant difference between the test scores of the full captioning group and the keyword captioning group. The researcher reported also that keyword captions are more beneficial for beginners because it may not result in a large cognitive load.

In another study, Park (2004) compared the effects of keyword captions, which he also called "partial captions," to full-script captions and no captions on the listening comprehension of Korean ESL students studying in the US. The students had three levels of proficiency: low intermediate, intermediate, and high intermediate. Results showed that for high intermediate learners, both full captions and keyword captions outperformed the control group. Captioning groups scored equally well. For the intermediate learners, both captioning groups outperformed the control group. However, the full captioning group outperformed the keywords captioning group. Regarding the low intermediate learners, the full captioning group outperformed the keywords captioning and no captioning groups. No significant difference was found between the keywords captioning group and the no captioning group. Contrary to Guillory's findings, Park (2004) found that keywords were beneficial for high intermediate learners only. However, these results should not be generalized given the limitations of the study. All learners with different levels of proficiency watched the same video. The video could be too difficult for the lower intermediate and intermediate-level learners (Vanderplank, 2010; Winke, et al., 2010). Had the video matched the learners' proficiency level the keyword captions could have proved to be beneficial. Moreover, Park (2004) did not report the percentage of keywords text density compared to the full captions. This lack of reporting makes it hard to compare his findings to other studies.

Montero Perez et al. (2013) compared the impact of two captioning types (full captions and keyword captions) to a no captioning group on listening comprehension. The participants, who were undergraduate students studying French at a Flemish university, watched three short French clips before taking a listening comprehension test, which covered global and detailed questions. Findings revealed that the full captioning group outscored the keyword and the no captioning group on the global comprehension questions. Moreover, there was no significant difference between the test scores of the keyword captioning and the no captioning group. In a more recent study, Montero Perez et al. (2014) compared another type of captioning: full captions with highlighted keywords to full captions and keyword captions. The control group had no captions. The results showed no significant difference between the performance of the captioning groups as well as the no captioning group. In other words, captioning did not enhance the performance of the participants on the comprehension tests. Montero Perez et al. attributed this result to the type of information targeted by the comprehension questions, which focused only on the content that did not include the target words, which was also part of the authors' study. The very few studies that examined the benefits of keyword captioning for improving comprehension have reached inconclusive results. The question regarding the most beneficial type of captioning for comprehension remains unanswered. This study aims at contributing to this line of research by comparing the impact of two captioning types (full captions and keyword captions) to no captioning for listening comprehension. Moreover, this study involves Arabic participants whose native language has a non-Roman script. The researcher is not aware of any other study that examined the impact of different modes of captioning among native speakers of Arabic.

3. Research questions

This study investigates the following three research questions:

1- Do videos with full captions result in better listening comprehension than non-captioned ones?

2- Do videos with keyword captions result in better listening comprehension than non-captioned ones?

3- Which mode of video captioning (full or keywords) results in better listening comprehension?

4. Methods

4.1. Participants

Participants in this study were thirty six beginning-level ESL students enrolled in English courses at a public university in the Gulf region. They were all native speakers of Arabic and did not travel overseas

for any language training. Since classes are segregated by sex, the researcher could not have access to the female campus. Therefore, only male students were recruited for this study. All students were freshmen taking English courses as part of school requirements. Participants were informed that the study was voluntary. Those who agreed to take part in the study received extra credit in their English course by their respective instructors. Students had an elementary level of English as measured by the English Department. Participants were randomly divided into one of the following conditions: full captioning (FC), keyword captioning (KC), or no captioning (NC). Two groups had twelve students each. One group had thirteen students.

4.2. Materials

The three video clips selected for the experiment were documentaries from an educational program. The researcher got written permission from the author of the video clips to be used in this study. The clips covered the topic of famous national parks in the United States. Each clip presents one national park. The narrator is an American whose speech pace is not too fast for the target students. The length of the video clips ranges between two and three minutes following Lavery's (1984) recommendation. The average words per minute was101. Two experienced university professors rated the video clips as appropriate in terms of difficulty and content for the target students. A committee composed of four professors served as keyword selectors. They selected important words for understanding each segment. The selected keywords represented 31% of the total script. This percentage is consistent with previous studies (e.g., Baltova, 1999; Rooney, 2014) that used keywords rated ranging between 30 and 50% of the full script.

4.3. Instruments

4.1.1. Listening comprehension tests

A comprehension test was developed for each video clip. The three tests included 15 multiple-choice items. The questions measured the students' understanding of the main ideas of the video clips. Participants completed the three tests after viewing the video clips. The researcher adopted the same test format that was used by previous studies (e.g., Winke et al., 2010). Each correct answer was worth one point so scores range between zero and 15 points. The tests were piloted with a group of students who had the same level of proficiency. The test had an adequate level of reliability with a Cronbach alpha value of .79. A few adjustments were made to the tests based on the feedback received from instructors.

4.1.2. Listening comprehension tests
In the final questionnaire, the participants of the FC and KC group were asked whether they watched any videos with captions prior to the study. If they did, then they had to mention the approximate number of videos they had watched. They were also asked whether they watched the video clips used in the study. They were instructed to rate their familiarity with the topic of the video clips. In addition, participants rated the difficulty level of the comprehension questions of each video clip. The second part of the questionnaire, which was completed by participants of all three groups, consisted of three five-point Likert scale questions: one item on captions use: "I was distracted by the presence of captions on the screen and that made me focus less on the audio", and two items on the usefulness of captions (e.g., "the captions were helpful when answering the questions on the listening tests") following the design of Montero Perez et al. (2013). The questionnaire data was used to help clarify the findings of this study.

5. Data analysis

The materials and procedures were pilot tested with a group of 13 students two weeks before the experiment. The results of the pilot did not reveal any major problems with the instruments, but adjustments were made to the way the video clips were delivered. Some students tried to rewind the video clips to check their answers, which resulted in multiple viewings. This problem was solved by broadcasting the video clips from the instructor's station. Therefore, students were denied the option of pausing or rewinding the video clips. All students were tested in one single session in order to avoid students sharing their answers with other participants. The procedures of the experiment were explained to students. They were given the opportunity to ask any questions. Students were reassured that the results of the comprehension test scores would not be counted. In fact, students did not have to write their names or ID number. The FC group watched video clips with captions. The KC watched video clips with keyword captions. The NC watched video clips with no captions. Then they took comprehension tests and completed a brief questionnaire. The whole procedure took about an hour.

6. Results

The first question examined whether the presence of full captions will result in better listening comprehension than non-captioned videos as measured by listening comprehension tests.   The descriptive statistics associated with participants' listening comprehension test scores are reported in table 1. It can be seen that the NC (N =12) group was associated with the numerically smallest mean of test scores (M = 11.08) and the FC (N =13) group was associated with the numerically highest mean (M = 12.92).   To examine whether significant difference existed between groups, a one-way ANOVA was performed. The assumption of homogeneity was tested and satisfied based on Levene's F test, $F(2,34) = 3.11$, $p = .058$.

The independent between-groups ANOVA yielded a statistically significant effect, $F(2, 34) = 4.54$, $p = .018$, $\eta2 = .211$ (see Table 2). To evaluate the nature of differences between the means further, the statistically significant ANOVA was followed up with Fisher's LSD tests. The difference between listening comprehension test scores of the FC group and the listening comprehension test scores of the NC group was statistically significant, $t(34) = -2.98$, $p = .014$ (see Table 3). These results suggest that full captions helped FC group achieve higher scores in listening comprehension tests than the NC group. All tables should be numbered with Arabic numerals. Headings should be placed above tables, underlined and centred. Leave one line space between the heading and the table. Only horizontal lines should be used within a table, to distinguish the column headings from the body of the table. Tables must be embedded into the text and not supplied separately.

Table 1. Mean Scores and Standard Deviations on the Comprehension Tests

	FC (N = 13)		KC (N = 12)		NC (N = 12)		All Groups	
	M	SD	M	SD	M	SD	M	SD
Comprehension Tests	12.92	1.17	11.50	2.02	11.08	1.83	11.83	1.84

Table 2. One-way ANOVA of the listening comprehension tests

	SS	df	MS	F	P	η2
Between groups	34.89	2	17.45	4.54	.018	.211
Within groups	130.84	34	3.85			
Total	165.73	36				

Table 3. Fisher's LSD comparison for listening comprehension tests

(I) Group	(J) Group	Mean Diff (I-J)	Std. Error	P	95% Confidence Interval	
					Lower Bound	Upper Bound
NC	KC	-.917	.801	.260	-2.54	.71
	FC	-2.340*	.785	.005	-3.94	-.74
KC	NC	.917	.801	.260	-.71	2.54
	FC	-1.423	.785	.079	-3.02	.17
FC	NC	2.340*	.785	.005	.74	3.94
	KC	1.423	.785	.079	-.17	3.02

* $p < 0.05$

The second question compared the impact of keyword captioning compared to no captioning on listening comprehension tests. The KC group (N =12) was associated with a listening comprehension test score of M = 11.50 (SD = 2.02). By comparison, the NC group (N =12) was associated with a numerically smaller test score of M = 11.08 (SD = 1.83). Post hoc comparisons using Fisher's LSD indicated that there were no significant differences between the listening comprehension test scores of the FC group and the listening comprehension test scores of the NC group , t(34) = .80, p = .26 (see table 3). These results suggest that keyword captions did not result in higher comprehension test scores than the NC group.

The third research question examined which mode of video captioning (FC and KC) had a better effect on listening comprehension. The FC group was associated with a listening comprehension test score of M = 12.92 (SD = 1.17). By comparison, the KC group was associated with a listening comprehension test score of M = 11.50 (SD = 2.02). To examine the differences among these two groups, Fisher's LSD post hoc test was performed. Results showed that there were no significant differences between the listening comprehension test scores of the FC group and the listening comprehension test scores of the KC group ,t(34) = .79, p = .079 (see table 3). These results suggest that full captions did not result in significantly higher listening comprehension test scores than keyword captions.

Results of the poststudy questionnaire

Results of the questionnaire are reported in table 4 and table 5.

Table 4. Participants Responses to the Questionnaire (part I)

	Items	FC	KC	NC
1.	Have you ever watched these particular videos before?			
	Yes	0	0	0
	No	12	12	12
2.	How familiar are you with the content of the videos?			
	Very familiar	4	4	5
	Somewhat familiar	7	7	6
	Not familiar	1	1	1
3.	Have you ever watched videos with captions before?			
	No	4	2	
	Yes. 5 or less	2	3	
	Yes. 6 or more	0	0	
	Yes. 10 or more	5	5	

Table 5. Participants Responses to the Questionnaire (part II)

		FC		KC		NC	
	Items	M	SD	M	SD	M	SD
4.	I was distracted by the presence of captions on the screen and that made me focus less on the audio.	3.08	1.63	3.75	1.36		
5.	The captions were helpful when answering the questions on the listening tests.	2.75	1.29	2.42	1.45		
6.	I didn't always read the captions on the screen.	2.50	1.25	3.58	1.17		
7.	The comprehension questions						
	Video 1	1.33	.492	1.33	.492	1.17	.389
	Video 2	1.33	.492	1.68	.651	1.33	.651
	Video 3	1.83	.835	1.92	.900	1.83	.937

7. Discussion

This study set out to explore the efficiency of two types of video captioning (full captioning and keywords captioning) in enhancing learners' listening comprehension skills as measured by comprehension tests. The analyses revealed that FC group significantly outperformed the NC and KC groups on the listening comprehension tests. The results suggest that the presence of full captions helped participants of FC achieve higher listening comprehension test scores than participants who had access to keywords captions or no captions. These findings corroborate previous research (e.g., Baltova, 1999; Chung, 1999; Markham, 2001; Montero Perez et al., 2013; Winke et al., 2010) that showed beneficial effects of full captioning on listening comprehension. Furthermore, this study found that FC outperformed the KC on listening comprehension tests. However, there were no significant differences between the two groups. These results are in line with those reported by Montero Perez et al. (2013).

The fact that the participants of FC group reported that captions helped them answer the questions on the tests more than what participants of the KC reported (Item 5) may suggest that FC relied more on captions than the KC group. The FC participants' reliance on captions might have been caused by their lack of confidence in their listening ability (Graham, 2006; Pujola, 2002). Learners tend to consider their listening skills less developed than their reading skills (Montero Perez et al., 2013). Full captions alleviate learners' listening anxiety (Vanderplank, 1988). This may result in a better listening ability (Graham, 2006). The majority of learners believe that full captions allow them to enhance their comprehension (Montero, 2013).

Furthermore, findings of this study revealed that the KC group outscored the NC group, but there were no significant statistical differences between the two groups. Both KC and NC groups were outperformed by the FC group. These results are consistent with the findings reported by Montero Perez et al. (2013) and Park (2004). The latter did not report any benefits of keywords captioning for lower-intermediate learners. However, this current study does not support Guillory's (1998) research outcomes. She found that full captioning and keyword captioning groups significantly outperformed the non-captioning group on the listening comprehension test.

Results of the questionnaire may help explain why KC did not outperform the NC. Five students of the KC group did not always read the captions (Item 6). Furthermore, most students felt distracted by even the mere presence of captions (m=3.75). Consequently, they focused less on the audio. These results corroborate the findings of Montero Perez et al. (2013) who reported that learners had a rather negative opinion about the presence of keyword captions. They emphasized that keyword captions were a major source of distraction and that they impeded their listening.

Some of the students' responses may explain why KC did not outperform the FC. The average score on Item 6 indicates that participants of KC group did not always read the captions (m=3.58) compared with the FC who reported an average score of 2.5 out of 5. Furthermore, participants of KC group felt distracted by the presence of captions, with an average score of 3.75 compared with the FC group (m= 2.50). Overall, the KC group found that captions did not help them answer the questions on the tests (Item 5).

It is important to mention that the difficulty of the comprehension questions did not seem to be a factor since both FC and KC had an identical score of 1.33 (Item 7). Similarly, the non-familiarity of participants with captioned videos did not play a role in the higher scores by the FC group in listening comprehension tests. In fact, four learners from FC had never watched captioned videos before the study compared with two from the KC group.

8. Pedagogical implications

The outcomes of this study provide the following implications. First, teachers should consider incorporating videos with full captions into English language curriculum especially for elementary-level students. Captioned videos could help students enhance their listening skills. These videos can be either

part of the class activities or assigned as homework for further practice. If captioned videos are used in class, students should be given the opportunity to view the video clips multiple times since most of participants in this study preferred viewing the video clips three times. Of course, the need to view the videos three times might depend on the language proficiency of the participants. More advanced students might not feel that they need three repetitions.

9. Limitations

There are a number of limitations in this study. The first limitation concerns the sample size. This study used a small sample size that may not be representative of the target population. Having a larger number of participants may have yielded different results. Second, the video materials are documentaries that covered only one single topic. It would be more interesting for students to watch video clips that cover materials related to a variety of topics that interest them. Alternatively, one short movie with an appealing story can make the learners' experience more interesting. However, adding more topics, and hence more videos, would also add complications to interpreting the results because of introducing factors leading to possible varying passage difficulty. Additionally, given the short length of the video clips, the comprehension questions targeted factual information only. No questions tested learners' understanding of inferred meaning. Therefore, this study does not cover the full picture about the effectiveness of captioning (Montero Perez et al., 2013). Third, some of the students had no previous experience with captions. Learners may have been able to use captions effectively to enhance their understanding of video clips if they had the opportunity to practice prior to their participation in the study.   Therefore, the outcomes of this study might have been different given different circumstances.

10. Future research

Research is needed to further investigate the impact of keyword captioning on listening comprehension of FL learners. First, there is a need to conduct studies involving participants with different native tongues who are learning a FL. So far, studies about keyword captions are minimal. Second, there is also a need to compare the performance of students with different levels of proficiency, preferably in the same educational setting. Third, future studies should be long-term so that learners become very familiar with the way to use captions effectively. Fourth, there should be future investigations involving various kinds of passages with a variety of different topics. The use of passages that are different regarding difficulty, content, and passage type will result in differential outcomes. Fifth, it would be interesting to study the way learners deal with captions if they are given the option of turning them on and off. The purpose would be to investigate under what conditions captions were turned on by learners.   Another study might enable the researchers to study the learners' ability to answer inferencing questions, not just questions related to factual information.

11. Conclusion

The overall findings of this study support the use of full video captioning to enhance listening comprehension. The results regarding keyword captioning are not nearly as supportive. The availability of keyword captioning did not yield better results than having no access to captions. Given that fully captioned video material is easier than ever to produce, the positive listening comprehension benefits of adding captions to existing videos should continue to be more fully explored.

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